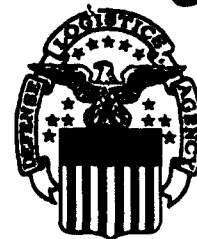


AD-A280 717



DLA-94-P30116

# COST OF LATE DELIVERY FOR POST AWARD CONSIDERATION

MAY 1994

94-19548



DTIC  
ELECTE  
JUN 28 1994  
S G D

FOR  
DEPARTMENT OF DEFENSE  
DEFENSE LOGISTICS AGENCY  
Executive Director (Procurement)  
CAMERON STATION  
ALEXANDRIA, VA 22304-6100

   
INSIGHT THROUGH ANALYSIS

DORO

94 6 27 013

DTIC QUALITY INSPECTED

DLA-94-P30116

# **COST OF LATE DELIVERY FOR POST AWARD CONSIDERATION**

MAY 1994

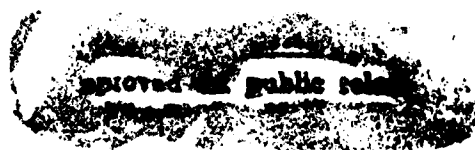
BURNHAM S. GOULD, JR.

Accession For	
NTIS	CRA&I <input checked="checked" type="checkbox"/>
DTIC	TAB <input checked="checked" type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

## **DEPARTMENT OF DEFENSE DEFENSE LOGISTICS AGENCY Operations Research Office**

c/o Defense General Supply Center  
8000 Jefferson Davis Highway  
Richmond, VA 23297-5082

O'Hare International Airport  
P.O. Box 66422  
Chicago, IL 60666-0422





DEFENSE LOGISTICS AGENCY  
OPERATIONS RESEARCH OFFICE  
DORO  
c/o DEFENSE GENERAL SUPPLY CENTER  
RICHMOND, VIRGINIA 23297-5082

IN REPLY  
REFER TO

## FOREWORD

The Defense Logistics Agency (DLA) Operations Research Office (DORO) completed the original evaluation of the cost of late delivery for the Defense General Supply Center (DGSC) in 1987. It was updated and extended to the other hardware centers in 1988. The evaluation was updated in 1991 and again in 1993.

The studies have been used for many purposes, both at DLA headquarters and in the field. Originally they were intended to serve as bid evaluation factors in Best Value procurement. Hence, the analyses focused on average costs to DLA for all late deliveries.

A principal use of the analyses has been negotiating consideration from contractors requesting contract modifications for anticipated delinquencies. However, this use has been controversial. Since the analyses were not performed with appropriate consideration in mind, there has been uncertainty about whether the most pertinent costs were being captured. Consequently, use of study results has not been consistent.

This study was initiated to determine the costs of late delivery specifically applicable to post award consideration. The results differ from those provided in earlier studies in many ways. They are not only more current and specific to the application, but also more supportable. More importantly, they are much easier to use and understand.

Use of the procedure for computing consideration recommended herein can produce very substantial savings for DLA.

*Gerald F. Wynngaard*  
GERALD F. WYNGAARD

Colonel, USAF  
Chief, DLA Operations Research Office

## EXECUTIVE SUMMARY

The objective of this study is to provide contracting officers and administrators with the best possible cost data for use in negotiating consideration with delinquent contractors. The study includes the pertinent costs at all DLA supply centers except the Defense Fuel Supply Center (DFSC). It is not included because, in general, delays in delivery of items it manages are governed by different procedures (e.g. demurrage).

Alternative ways of estimating the pertinent costs were reviewed and the most appropriate methods were selected. Costs were categorized as being either direct or indirect. Direct costs refer to the administrative costs (labor, materials, computer time, etc) for monitoring late deliveries and modifying contracts to extend delivery dates. They were estimated using data from both engineered time standards and, to the extent practicable, the newer Activity Based Costing system. Important information was provided by points of contact at most of the supply centers.

Indirect costs refer to the costs of carrying additional inventory. They were estimated using simulations of the procurement system at each supply center. The simulations modeled the effects of late deliveries on projected production lead times and the resulting increases in inventory investment for safety stock.

Cost estimates are provided which are appropriate and specific for determining consideration to be sought for late contractor delivery for each supply center. In addition, indirect cost estimates are shown for each Federal Supply Class (FSC). Total indirect costs from carrying additional inventory caused by late deliveries during Fiscal Year (FY) 1993 are estimated to be about \$44 million.

It is recommended that the following formula be used universally to calculate consideration sought:

$$C = \$100 + (R * L * V)$$

where:

C = Consideration sought (\$).

R = Ratio unique for each supply center (measured in dollars of cost per dollar of contract value per day of lateness) as shown below:

Construction	0.00134
Electronics	0.00043
General	0.00081
Industrial	0.00060
Clothing & Textile	0.00017
Medical	0.00029
Subsistence	0.00017

**L = Lateness (days).**

**V = Value of extended portion of contract (\$).**

**Use of this formula is important, not only because of the monies recovered, but also because it motivates suppliers to provide product on a timely basis, thereby enabling DLA to reduce safety stock and improve customer service. The relative simplicity of the formula makes it easy to use and understand.**

**It is further recommended that the cost estimates be updated in early 1995 using data expected from the new Activity Based Costing (ABC) system.**

## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
	FOREWORD	iii
	EXECUTIVE SUMMARY	v
	TABLE OF CONTENTS	vii
	ABBREVIATIONS	ix
1	INTRODUCTION	1-1
1.1	Background	1-1
1.2	Objective	1-1
1.3	Scope	1-1
2	METHODOLOGY	2-1
2.1	Overview	2-1
2.2	Direct Costs	2-1
2.2.1	Methods	2-1
2.2.2	Traditional Approach, Overview	2-2
2.2.3	Traditional Approach, Data by Supply Center	2-3
2.2.3.1	DCSC	2-3
2.2.3.2	DESC	2-3
2.2.3.3	DGSC	2-3
2.2.3.4	DISC	2-4
2.2.3.5	DPSC(C&T)	2-4
2.2.3.6	DPSC(Medical)	2-4
2.2.3.7	DPSC(Subsistence)	2-4
2.2.3.8	DCMC	2-4
2.2.4	Activity Based Costing Approach	2-5
2.3	Indirect Costs	2-6
2.3.1	General Approach	2-6
2.3.2	Assumptions	2-6
3	RESULTS	3-1
3.1	Direct Costs	3-1
3.2	Indirect Costs	3-1
3.2.1	Overview	3-1
3.2.2	Summary Statistics	3-2
3.2.3	FSC Statistics	3-2
4	CONCLUSIONS	4-1
4.1	Direct Costs	4-1
4.2	Indirect Costs	4-1
4.3	Benefits	4-1
4.4	Other Uses	4-1

## TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
5	RECOMMENDATIONS	5-1
	APPENDIX A: Estimate of Time Required for Contract Modification	A-1
	APPENDIX B: Indirect Cost Results by FSC	B-1

## ABBREVIATIONS

ABC	Activity Based Costing
C&T	Clothing and Textile
CAILE	Corporate Administration, Policy Group, Economic Analysis Team
CBU	Commodity Business Unit
DCMC	Defense Contract Management Command
DCSC	Defense Construction Supply Center
DESC	Defense Electronics Supply Center
DFSC	Defense Fuel Supply Center
DGSC	Defense General Supply Center
DIMES	Defense Integrated Management Engineering System
DISC	Defense Industrial Supply Center
DLA	Defense Logistics Agency
DORO	DLA Operations Research Office
DPSC	Defense Personnel Support Center
DPSSO	DLA Performance Standards Support Office
FSC	Federal Supply Class
FY	Fiscal Year
HQ	Headquarters
IPU	Integrated Process Unit
NSN	National Stock Number
PERMES	Projected Supply Performance Model
SF	Standard Form



## **SECTION 1**

### **INTRODUCTION**

#### **1.1                    BACKGROUND**

The precursor of this analysis is a DORO study entitled Analysis of the Cost of Late Contractor Delivery, dated September 1987. That study focused on the Defense General Supply Center (DGSC). In 1988 it was updated and extended to the other hardware centers. The evaluation was updated again in 1991 and 1993. The study, with its updates and extensions, has been widely used both at DLA headquarters and in the field.

Since the original study was prepared the range of application has evolved. The study was designed for use as a bid evaluation factor in best value procurements. That approach to source selection has been superseded by other approaches.

Currently, the principal use of the analyses is providing a basis for negotiating consideration from contractors requesting contract modifications for anticipated delinquencies. However, this use is controversial. Since the analyses were not performed with that use in mind, there is uncertainty about whether the most pertinent costs were captured. This has contributed to the inconsistent use of these studies to determine consideration to be sought on delinquent contracts.

#### **1.2                    OBJECTIVE**

The objective of this study is to provide contracting officers and administrators with the best possible cost data for use in negotiating consideration with delinquent contractors. This involves not only updating cost information provided in earlier studies but also modifying the analytical procedures used to better reflect current study applications and procurement practices.

#### **1.3                    SCOPE**

The study includes the costs of late delivery at the Defense Construction Supply Center (DCSC), the Defense Electronics Supply Center (DESC), DGSC, Defense Industrial Supply Center (DISC), and, to the extent practicable, the three Defense Personnel Support Center (DPSC) commodities (i.e. Clothing & Textile (C&T), Medical, and Subsistence). DFSC is not included because, in general, delays in delivery of items it manages are governed by demurrage procedures.

The study is limited to costs incurred at DLA. Costs incurred by DLA customers as a result of late contractor deliveries are not considered.

## **SECTION 2 METHODOLOGY**

### **2.1                    OVERVIEW**

The general approach used in this study is similar to that used in previous DORO studies. However, data sources and some of the underlying assumptions have been changed. Total cost is defined as the sum of direct cost and indirect cost.

Direct cost refers to the incremental cost of performing functions on contracts involving late deliveries for post award consideration that are not performed on other contracts. Many of the incremental costs are associated with modifying the contracts to extend delivery dates in return for lower prices.

Indirect costs refers to the cost of carrying additional future inventory that results from the increased estimates of production lead time triggered by the extended deliveries.

Consideration is expressed algebraically using the formula:

$$C = D + (R * L * V)$$

where:

C = Consideration sought (\$).

D = Direct cost (\$).

R= Ratio, also called "Day Cost Ratio". (More precisely, the cost per day of lateness of additional inventory resulting from increased production lead time triggered by late delivery expressed as a proportion of contract cost.)

L = Lateness. (Number of days that delivery schedule is extended.)

V = Value of extended portion of contract (\$).

$R * L * V$  = Indirect cost.

### **2.2                    DIRECT COSTS**

#### **2.2.1                METHODS**

An attempt was made to estimate direct costs for each supply center using two different methods: the traditional method and Activity Based Costing. The traditional method focuses on identifying what activities (steps) are performed, how long each activity requires, and how frequently each activity is performed. Data from Defense Integrated Management Engineering

System (DIMES) Standards are utilized wherever possible. These data are used to develop an estimate of the average number of hours directly involved in processing late deliveries for post award consideration. An estimate of the average hourly labor cost involved in processing late deliveries also is made. The product of the estimates of average number of hours and hourly cost yields the estimate of labor cost. An estimate also is made of average material cost (e.g. telephone calls, paper, postage, computer time, etc.). Estimated total direct cost per late delivery is the sum of the labor and material cost estimates.

Activity Based Costing involves measuring all costs, including indirect costs, and then allocating them to functional categories. Each functional category must have a measure of output (i.e. product). Cost divided by output yields unit cost. To utilize Activity Based Costing in the present context, ideally it would be nice to have lots of data for which the functional category is Processing Late Deliveries for Post Award Consideration and the measure of output is Number of Contract Modifications for Late Delivery.

The two approaches give quite different results. The traditional approach focuses on clearly identifiable tasks and is well understood. Much relevant data are readily available from DIMES standards. Overhead and support costs are not captured. Long run ripple effects of changes in workload upon support functions are not considered.

In contrast, Activity Based Costing is new. It provides fully allocated costs. Thus, the estimates provided by this approach are much higher than those using the traditional approach.

Which approach is the more appropriate? The answer basically requires an assumption about how spending levels (i.e. costs) will change in response to changes in workload. Experience suggests that in the short run (e.g. a month, the current fiscal year) changes in workload have only minor effects upon staffing levels and other budgeted expense items. However, over long periods of time (e.g. years, decades) most costs, including support costs, do vary almost directly with workload.

Currently DLA is undergoing rapid organizational change. Budgets may be expected to change in response to changes in workload. Therefore, at this juncture costs developed from Activity Based Costing appear to be more relevant than do costs based upon the traditional approach. Unfortunately, Activity Based Costing is just being implemented within DLA. Only limited data are available at this time.

## **2.2.2 TRADITIONAL APPROACH, OVERVIEW**

As a point of departure, DORO prepared the estimate of the labor hours incurred by a late delivery for post award consideration shown in Appendix A. The estimate was based primarily on data contained in DIMES Standard 1530, Special Purpose Data for Post Award (Contract Management), January 1991. The processing procedures, base times, and frequencies shown in that standard were reviewed and modified based upon discussions with knowledgeable persons at the DLA Performance Standards Support Office (DPSSO) and DGSC. Throughout this subsection this document is called, "The DORO Point of Departure".

Points of contact were developed for each supply center. They were asked to review the steps, times, and frequencies provided in The DORO Point of Departure and to provide appropriate changes and additions. They also were asked to provide the distribution of pay grades of personnel involved in processing late deliveries. Finally, they were asked to provide an estimate of the extra direct material cost involved in processing late deliveries for post award consideration. (Material cost includes telephone calls, forms, stationery, paper, postage, computer time for interrogation of files and generation of reports, etc..)

Responses from the points of contact were analyzed. Then they were put on a common basis using the following assumptions:

1. Normal times for performing functions were increased by 11.4 percent (based on information in DPSSO reports) to allow for personal, fatigue and delay.
2. Total paid time included an allowance of 18 percent of total time for paid holidays, leave, and other non-productive time [provided by HQ DLA, Corporate Administration, Policy Group, Economic Analysis Team (CAILE)].
3. Wage rates were increased by 29.55 percent (provided by HQ DLA, CAILE) to allow for such benefits as retirement and health insurance.
4. In the absence of other information, material costs were assumed to be 19 percent of labor costs. This factor was obtained from the precursor study performed by DORO in 1988.

The information developed for each supply center is discussed in the following subsection.

### **2.2.3 TRADITIONAL APPROACH, DATA BY SUPPLY CENTER**

#### **2.2.3.1 DCSC**

The DCSC response provided neither answers to the questions asked nor alternative ways of estimating direct cost per late delivery. Therefore, data from DCSC could not be used in the analysis (see Subsection 3.1).

#### **2.2.3.2 DESC**

DESC reviewed and revised the processing procedures, base times, and frequencies in DIMES Standard 1530. It also added an allowance for additional steps, such as legal review, that are sometimes required. The summary estimate of direct cost per late delivery is as follows:

Labor hours	2.275
Labor cost per hour (\$)	20.65
Total labor cost	\$46.98
Material cost	\$ 8.93
Total cost	\$55.91

**2.2.3.3****DGSC**

DGSC carefully reviewed the processing procedures, base times, and frequencies involved. Many additions were made to The DORO Point of Departure. The summary estimate of direct cost per late delivery is as follows:

Labor hours	3.478
Labor cost per hour (\$)	20.28
Total labor cost	\$70.53
Material cost	\$13.40
Total cost	\$83.93

**2.2.3.4****DISC**

DISC did not make changes to The DORO Point of Departure. Accordingly, the summary estimate of direct cost per late delivery is as follows:

Labor hours	1.273
Labor cost per hour (\$)	20.52
Total labor cost	\$26.12
Material cost	\$ 4.96
Total cost	\$31.08

**2.2.3.5****DPSC(C&T)**

DPSC(C&T) noted that its procedures involve several elements not reflected in The DORO Point of Departure, including Legal review, Supply Operations Division review, Section Chief review, and Branch Chief review and approval. This adds about one-half hour to the normal time provided. Accordingly, the summary estimate of direct cost per late delivery is as follows:

Labor hours	1.882
Labor cost per hour (\$)	28.62
Total labor cost	\$53.87
Material cost	\$10.24
Total cost	\$64.11

**2.2.3.6****DPSC(Medical)**

DPSC(Medical) carefully reviewed the processing procedures, base times, and frequencies involved. Many additions were made to The DORO Point of Departure. Also DPSC(Medical) noted that direct material cost would not be more than 5 percent of labor cost. The summary estimate of direct cost per late delivery is as follows:

Labor hours	1.866
Labor cost per hour (\$)	23.38
Total labor cost	\$43.64
Material cost	\$ 2.18
Total cost	\$45.82

#### **2.2.3.7 DPSC(Subsistence)**

DPSC(Subsistence) has not provided data for this study. Therefore, data from DPSC (Subsistence) could not be used in the analysis (see Subsection 3.1).

#### **2.2.3.8 Defense Contract Management Command (DCMC)**

Although DCMC is not a supply center it manages many contracts for supply centers. These usually include larger, more complex contracts. Accordingly, the cost of late deliveries for contracts handled by DCMC also was estimated. This was based upon discussions with knowledgeable persons at DPSSO, as well as upon DIMES Standards and The DORO Point of Departure. Specifically, the estimate consisted of the times given in DIMES Standard 3202, Special Purpose Data for Process DD Form 1155/SF 26, DIMES Standard 3206, Special Purpose Data for Anticipated or Actual Delay in Delivery or Performance (AADDP), and elements A, B, and C in The DORO Point of Departure.

The summary estimate of direct cost per late delivery is as follows:

Labor hours	3.604
Labor cost per hour (\$)	24.38
Total labor cost	\$87.87
Material cost	\$16.70
Total cost	\$104.57

#### **2.2.4 ACTIVITY BASED COSTING APPROACH**

Activity Based Costing is just getting underway. DISC, which was the pilot supply center for ABC, was the only supply center that provided data. Based upon data collected for four months projected to twelve months and surveys of the amount of time attributed to working on late deliveries, the total direct cost of late deliveries during fiscal year 1993 was estimated as follows:

<u>Cost Module</u>	<u>Total Cost</u>	<u>Time for Late Deliveries</u>	<u>Cost of Late Deliveries</u>
A.441 Monitor Awd Perf, CBU	\$3,903,000	44%	\$1,717,500
A.442 Proc Instr Update, CBU	365,465	44%	160,805
A.442 Proc Instr Update, IPU	550,616	10%	55,062
<b>TOTAL</b>			<b>\$1,933,187</b>

The average number of contracts modified per month in calendar year 1993 was 1078 (versus 1162 in 1992). Assuming that 44 percent of them involved late delivery about  $1078 * 12 * 0.44 = 5692$  contracts were modified for late delivery during 1993. This implies a cost per late delivery of  $\$1,933,187 / 5692 = \$339.62$ .

The foregoing estimate probably is biased on the high side. The cost module for Monitoring Award Performance includes activities other than contract modification. Also, contract modifications for the single purpose of extending delivery dates in return for lower contract consideration are less complicated than the average contract modification. Nevertheless, the foregoing estimate should be considered in developing a comprehensive estimate of the direct cost of late delivery for post award consideration.

## **2.3                      INDIRECT COSTS**

### **2.3.1                      GENERAL APPROACH**

Late deliveries strain the inventory control system, resulting in higher costs. How the inventory control system responds and what costs are incurred depends upon many factors. Some alternative ways of estimating these costs are described in the following studies:

- (1) Analysis of the Cost of Late Contractor Delivery, DORO, September 1987. This study was updated in 1989, 1991, and 1993.
- (2) Computation of Production Leadtime Savings, DORO, November 1992.
- (3) Liquidated Damages Assessments for Late Contractor Deliveries, DPSC, May 1990.

The methodology used in this study borrows most heavily from that in 2.3.1(1) (above). The purposes of the two studies are similar. The study in 2.3.2(2) is oriented to NSN specific analysis by Value Engineers. The study in 2.3.2(3) is a simulation of Clothing and Textile inventories.

### **2.3.2                      ASSUMPTIONS**

The principal assumptions used herein for all supply centers except DPSC(C&T) and DPSC(Subsistence) are as follows:

- (1) Late contractor delivery triggers an increase in projected production lead time equal to one third of the amount of the lateness. This, in turn, causes an increase in investment in inventory for safety stock. The amount of the increase is calculated using Projected Supply Performance Model (PERMES) simulations. Safety stocks are calculated for lead times varying between minus 90 and plus 90 days. Then the average change in safety stock per day of lead time is determined.
- (2) The increase in inventory is maintained (i.e. safety stock is not reduced) until product becomes obsolete.

(3) Residual value of obsolete product is negligible.

(4) The present value of the storage cost for the additional inventory is 4.583 percent of the value of that inventory. This is based on the following assumptions:

(a) Annual storage costs average one percent of inventory value. (The reasonableness of this assumption is well documented in many places, including the study made by Synergy, Inc. for DLA entitled Cost-To-Hold Methodology, 31 August 1992, revised 22 February 1993.)

(b) The remaining life of a typical item is one half of its ten year life. (DOD Parts Control Program Report PCP-86-01, Cost-Benefit Reporting Technique for Military Parts Control Advisory Groups, 7 November 1986, by DESC, assumes new parts have ten year life.)

(c) The applicable discount factor for 5 year projects is 3.6 percent (from memorandum, Discount Rates For Economic Analysis, Executive Director (Plans & Policy Integration), HQ DLA, 20 May 1993). The corresponding cumulative present value factor (mid-year method) for 5 years is 4.583.

(5) Parameter values used in the PERMES simulation model to calculate additional investment in inventory were those in use at each supply center as of 31 December 1993 (except that the system constant for DPSC(Medical) was as of 30 September 1993). These are as follows:

<u>Supply Center</u>	<u>Backorder Goal</u>	<u>System Constant</u>	<u>T-Factor</u>
DCSC	24,500	207,556,249	74
DESC	55,000	123,345,752	69
DGSC	32,000	212,615,862	87
DISC	46,000	165,000,000	95
DPSC(Medical)	12,000	12,861,966	95

Since DPSC(C&T) and DPSC(Subsistence) do not use variable safety levels, the assumptions described above are not appropriate for them. However, DPSC has studied liquidated damages assessments for late deliveries (see Subsection 2.3.1) and has adopted a policy of seeking consideration of 0.25 percent of contract value per 15 days of lateness. It is assumed that this policy is appropriate for C&T and Subsistence.



## **SECTION 3 RESULTS**

### **3.1                    DIRECT COSTS**

Estimates of the direct cost per late delivery for post award consideration, using the traditional approach for estimating cost, vary between about \$31 and \$105. The specific estimates are shown in Section 2.2.3. Two supply centers, DCSC and DPSC (Subsistence), did not provide usable data.

The only estimate of the direct cost per late delivery using Activity Based Costing is at \$340. This estimate is based on limited data.

The same value for the direct cost of late delivery for post award consideration should be used by all supply centers and by DCMC. Several factors lead to this position:

(a) Differences between supply centers in the estimates of the direct cost of late delivery seem to depend at least as much on how the questions are asked, the approach used in making the estimates, and the diligence used in preparing the estimates as on true differences in cost.

(b) In many cases a spot decision on whether DCMC or the responsible supply center should handle a late delivery for post award consideration must be made. Complicating this decision with differences in consideration to be sought would be awkward.

(c) In the absence of strong reasons to the contrary, determination of consideration to be sought should be kept simple.

Since data available from Activity Based Costing are very limited, cost estimates must continue to be based on data derived using the traditional approach. These data underestimate costs. Therefore, it is reasonable to let DGSC, the supply center having the highest cost estimate, represent all supply centers. Also costs for a supply center should reflect a mix of contracts administered by that supply center and those administered by DCMC for that supply center. Taking the average of the costs shown for DGSC (\$83.93) and DCMC (\$104.57) yields an estimate of \$94.25. This will be rounded to \$100.00.

### **3.2                    INDIRECT COSTS**

#### **3.2.1                OVERVIEW**

Indirect costs were calculated for DCSC, DESC, DGSC, DISC, and DPSC(Medical). The results are given in the subsections which follow. They were not calculated for DPSC(C&T) and DPSC(Subsistence) because they do not use variable safety levels. As explained in Subsection 2.3.2, it is assumed that their present policy (i.e. seeking consideration of 0.25 percent of contract value per 15 days of lateness) is appropriate. It is equivalent to a day cost ratio of 0.017 percent.

### 3.2.2

### SUMMARY STATISTICS

The average values by supply center for the three components of indirect costs (i.e. contract value, number of days late for late deliveries, and overall day cost ratio) for FY 93 are shown below. They correspond to average values for V, L, and R, respectively, in the formula in Section 2.1.

Supply Center	Average Contract Value (V)	Avg. No. of Days Late (L)	Overall Avg. Day Cost Ratio (%) (R)
DCSC	\$ 6,939.78	24	0.13402
DESC	5,950.73	35	0.04294
DGSC	9,782.31	34	0.08116
DISC	4,651.92	30	0.06043
DPSC(Medical)	36,804.55	49	0.02891

The table below shows indirect costs of late deliveries in FY93 by supply center. The middle column shows the total cost of a typical (i.e. average) late delivery. It corresponds to average values for  $R * L * V$ . The last column shows the total costs of all late deliveries. It corresponds to  $R * L * V$  summed across all FSCs.

Supply Center	Typical Total Indirect Cost ( $R * L * V$ )	Total Indirect Cost for Year ( $\Sigma R * L * V$ )
DCSC	\$ 223.21	\$ 9,468,000
DESC	89.44	1,694,000
DGSC	269.94	4,946,000
DISC	84.34	1,650,000
DPSC(Medical)	521.29	<u>26,091,000</u>
Total		\$43,849,000

The day cost ratio (%), supply center ratio, and number of contracts in FY 93 by FSC for each supply center are shown in Appendix B.

### 3.2.3

### FSC STATISTICS

The full range of day cost ratios (%) and the range of day cost ratios (%) for high volume FSCs (i.e. FSCs with at least 100 contracts each in FY 93) for each supply center are shown below:

<u>Supply Center</u>	<u>Full Range</u>		<u>Range for High Volume FSCs</u>	
	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>
DCSC	4.401	.015	.311	.061
DESC	.269	.004	.112	.012
DGSC	1.944	.001	.271	.026
DISC	.459	.013	.151	.013
DPSC(Medical)	.365	.003	.039	.018

The overall average day cost ratios provide an appropriate basis for determining indirect cost of late contractor delivery for post award consideration. Several factors lead to this position:

(a) The overall average day cost ratios by supply center provide reasonably good estimates of the cost to DLA of additional inventory resulting from late contractor delivery.

(b) The overall average day cost ratios by supply center fully and adequately reflect differences between supply centers in material management policy and procurement practices. Differences in overall average day cost ratios reflect differences in the parameter values used at each supply center in buying items with variable safety levels (see Subsection 2.3 ), as well as differences in characteristics of contracts.

(c) The use of FSC unique day cost ratios results in highly variable and sometimes excessive consideration cost estimates. Although variability is reduced if use of unique day cost ratios is limited to high volume FSCs, it still is disturbingly high. Whether such differences are supportable by the method of estimation used is questionable.

(d) In the absence of strong reasons to the contrary, determination of consideration to be sought should be kept simple.

## **SECTION 4 CONCLUSIONS**

### **4.1                    DIRECT COSTS**

Estimates derived from Activity Based Costing, with its focus on fully allocated costs, are more pertinent to the current environment than are estimates derived from the traditional approach. Unfortunately, data available from Activity Based Costing still are very limited. Therefore, at this time DLA must continue to rely primarily on estimates derived using the traditional approach.

For the present, a value of \$100 should be used for the direct cost of late delivery for post award consideration throughout DLA.

### **4.2                    INDIRECT COSTS**

The overall average day cost ratios calculated for DCSC, DESC, DGSC, DISC, and DPSC(Medical) provide an appropriate basis for determining indirect cost of late contractor delivery for post award consideration.

The procedure currently used at DPSC(C&T) and DPSC(Subsistence) for computing consideration is satisfactory. However, in the interest of uniformity with other supply centers, restating it in terms of a day cost ratio would be desirable.

### **4.3                    BENEFITS**

Late deliveries are very costly to DLA. As shown in Subsection 3.2, total indirect costs from carrying additional inventory caused by late deliveries during FY 93 at five supply centers are estimated to be about \$44 million. This is over and above any problems that late deliveries may cause DLA customers.

DLA needs to be proactive in controlling late deliveries. The seeking of consideration can be a major factor in this endeavor. The monies recovered, direct as well as indirect costs, are only part of the benefits. It also helps motivate suppliers to provide products on a timely basis, thereby reducing safety stock and improving customer service.

### **4.4                    OTHER USES**

The day cost ratios provided in Subsection 3.2 have a number of uses in addition to negotiating consideration from contractors anticipating late deliveries. However, care must be exercised to be sure that the assumptions fit the anticipated uses or that appropriate adjustments are made. In general, the ratios can be used in a straightforward manner to quantify the benefits of programs designed to reduce delinquencies. Examples are such programs as the Automated Best Value Model and the Quality Vendor Program.

The day cost ratios also may be used to quantify the effects of early delivery. Examples include Delivery Evaluation Factors used in bid evaluation and negotiations with vendors to expedite delivery schedules. In general, the ratios can be used where the early delivery can be viewed as indicative of future reductions in production lead time, thereby enabling DLA to reduce safety stock. They do not apply if the early delivery is strictly a one time event.

## SECTION 5 RECOMMENDATIONS

The formula given below should be used to determine consideration sought from delinquent contractors:

$$C = \$100 + (R * L * V)$$

where:

C = Consideration sought (\$).

R = Ratio. Use the overall average day cost ratio for the responsible supply center as shown below:

<u>Supply Center</u>	<u>Ratio</u>
DCSC	0.00134
DESC	0.00043
DGSC	0.00081
DISC	0.00060
DPSC(C&T)	0.00017
DPSC(Medical)	0.00029
DPSC(Subsistence)	0.00017

L = Lateness. Number of days that delivery schedule is extended.

V = Value of extended portion of contract (\$).

The factors provided above should be updated in early 1995. At that time it should be possible to develop direct cost estimates using a substantial amount information from Activity Based Costing. Overall average day cost ratios should be updated using contract data for FY 94 and parameter values for buying items with variable safety levels as of 31 Dec 94.

**APPENDIX A  
ESTIMATE OF TIME REQUIRED  
FOR CONTRACT MODIFICATION**

# ESTIMATE OF TIME REQUIRED FOR CONTRACT MODIFICATION

ELEMENT/STEP	STEPS			ELEMENTS		
	BASE TIME	FREQ OCCUR	NORMAL TIME	FREQ OCCUR	NORMAL TIME	
A. Receive Post Award (PA) Action Request						
1. Receive PA Action Request (Phone)	0.1306	0.0307	0.0040			
2. Make/Receive Additional Phone Calls	0.0857	0.0496	0.0043			
3. Receive PA Action Request (Correspondence)	0.0073	0.9693	0.0071			
4. Sort by Administrator	0.0051	0.9693	0.0049			
5. Distribute to Administrator	0.0017	0.9693	0.0016			
6. Maintain Control Records	0.0331	1.0000	0.0331			
Total				1.0000	0.0550	0.0550
B. Obtain/Return File Folder						
1. Examine PA Request for File Number	0.0045	1.0000	0.0045			
2. Complete File Request	0.0179	1.0000	0.0179			
3. Obtain/Return File (Regular)	0.0240	0.8907	0.0214			
4. Obtain/Return File (ASP)	0.0349	0.0794	0.0028			
5. Obtain/Return File (RHA)	0.0270	0.0300	0.0008			
6. Release to Administrator	0.0017	1.0000	0.0017			
Total				1.0000	0.0491	0.0491
C. Review/Determine Action (Large)						
1. Review Request	0.0149	1.0000	0.0149			
2. Examine File	0.0534	1.0000	0.0534			
3. Interrogate Computer Files	0.0364	1.0000	0.0364			
4. Phone for Additional Information	0.1189	2.0000*	0.2378			
5. Write Correspondence for Additional Information	0.1461	-*	0.0000			
6. Type and Forward Request for Additional Information	0.1345	-*	0.0000			
7. Receive Reply	0.0182	-*	0.0000			
8. Examine Added Data	0.0144	-*	0.0000			
9. Confer with Other Personnel	0.1345	0.0443	0.0060			
10. Prepare Determination and Findings (D&F)	0.4723	0.0100	0.0047			
11. Assemble/Forward Findings for Review/Approval	0.3618	0.0100	0.0036			
Total				1.0000	0.3568	0.3568



ELEMENT/STEP	STEPS		ELEMENTS	
	BASE TIME	FREQ OCCUR	NORMAL TIME	FREQ OCCUR
D. Review/Determine Action (Small)				
TOTAL				* —
E. Review/Determine Action (ASP)				
TOTAL				* —
F. Prepare Correspondence Phone Reply				
TOTAL				* —
G. Prepare Modification, SF-30				
1. Complete Overprinted Modification Form SF-30	0.0647	0.2997	0.0194	
2. Handscribe Modification, SF-30	0.1925	0.7003	0.1348	
3. Phone Requestor to Advise Action Taken	0.0719	0.0489	0.0035	
4. Reproduce Copies of Modification	0.0408	0.9035	0.0369	
5. Mail Advance Copy of Modification	0.0086	0.9035	0.0078	
6. Prepare Distribution List	0.0152	1.0000	0.0152	
7. Forward Modification, SF-30, for Further Processing	0.0060	1.0000	0.0060	
TOTAL			0.2236	1.0000*
H. Type/Review Modification, SF-30				
1. Type Modification, SF-30	0.1152	1.0000	0.1152	
2. Verify	0.0173	1.0000	0.0173	
3. Deliver to Administrator	0.0090	1.0000	0.0090	
4. Review Modification	0.0145	1.0000	0.0145	
TOTAL			0.1560	1.0000*
I. Control Modification, SF-30				
1. Mail Bilateral Modification, SF-30, For Signature	0.0455	1.0000	0.0455	
2. Receive Signed Modification, SF-30	0.0119	0.9565	0.0114	
3. Follow-up on Bilateral Modification, SF-30	0.0507	0.0435	0.0022	
4. Receive Follow-up Reply	0.0119	0.0435	0.0005	
5. Decontrol (Release) Folder	0.0214	1.0000	0.0214	
TOTAL			0.0810	0.5000*
				0.0405

ELEMENT/STEP	STEPS			ELEMENTS	
	BASE TIME	FREQ OCCUR	NORMAL TIME	FREQ OCCUR	NORMAL TIME
J. Forward Modification, SF-30, for Signature of Contracting Officer					
1. Forward Modification, SF-30, for Signature of Contracting Officer	0.0007	1.0000	0.0007		
2. Obtain Signed Modification	0.0014	1.0000	0.0014		
3. Forward for Further Processing	0.0060	1.0000	0.0060		
TOTAL				1.0000*	0.0081
K. Forward Correspondence/Phone Reply/Modification for System Update and/or Further Processing					
1. Obtain Action (Includes DCMR Modifications)	0.0019	1.0130	0.0121		
2. Review DCMR Modification	0.0383	0.0130	0.0005		
3. Interrogate Computer	0.0364	0.0071	0.0003		
4. Obtain/Review/Return Contract Folder	0.0815	0.0064	0.0005		
5. Complete Input/Control Sheet	0.0212	1.0024	0.0213		
6. Forward Reply for System Update and/or Further Processing	0.0128	1.0130	0.0130		
TOTAL				1.0000	0.0477
TOTAL NORMAL TIME					0.9368
Personal Fatigue and Delay Allowance of 11.4%					0.1068
TOTAL STANDARD TIME					1.0436

Source: DIMES Standard 1530, Special Purpose Data for Post Award (Contract Management), Jan 1991, except where noted.

\*Estimated for study of Cost of Late Delivery for Post Award Consideration.

**APPENDIX B**  
**INDIRECT COST RESULTS BY FSC**

## EFFECT OF LATE DELIVERY ON SAFETY LEVEL COST - DCSC

FSC	DAY COST RATIO(%)	DCSC RATIO(%)	NO. OF CONTRACTS
1005	0.103406	2.171535	324
1010	0.168563	3.539815	66
1015	0.070249	1.475221	73
1020	0.105196	2.209112	69
1025	0.093345	1.960243	66
1095	0.138518	2.908871	67
1450	0.066543	1.397397	23
1610	0.038180	0.801773	39
1615	0.103213	2.167482	296
1620	0.117576	2.469094	143
1630	0.087721	1.842132	110
1650	0.073874	1.551358	756
1710	0.068871	1.446295	38
1720	0.109323	2.295792	19
1730	0.126225	2.650722	363
1740	0.207341	4.354170	28
2010	0.061237	1.285976	136
2240	0.065125	1.367615	5
2510	0.148406	3.116524	1331
2520	0.164745	3.459641	1276
2530	0.179554	3.770632	1859
2540	0.143867	3.021214	2054
2590	0.104968	2.204327	953
2620	0.253525	5.324025	24
2805	0.122979	2.582565	253
2815	0.125969	2.645341	1421
2825	0.109723	2.304183	96
2895	0.134294	2.820183	6
2910	0.205200	4.309202	1505
2920	0.138166	2.901487	1174
2930	0.194964	4.094247	484
2940	0.311325	6.537816	987
2990	0.195347	4.102281	890
3010	0.125224	2.629708	503
3020	0.133723	2.808189	1026
3030	0.212480	4.462077	702
3040	0.110652	2.323691	1983
3120	4.400647	92.413589	1
3740	0.187644	3.940527	8
3770	0.366854	7.703938	13
3805	0.146584	3.078261	53
3810	0.221316	4.647637	23
3815	0.101328	2.127880	22
3820	0.366580	7.698185	12
3825	0.088723	1.863189	43
3830	0.183814	3.860087	93
3835	0.464674	9.758162	10
3895	0.251713	5.285982	38
3910	0.091510	1.921712	22
3930	0.101064	2.122338	97
3950	0.093864	1.971151	85
3960	0.102471	2.151888	9
4010	0.475446	9.984367	1
4210	0.094779	1.990350	348
4220	0.083500	1.753496	271
4240	0.089454	1.878528	5
4310	0.073189	1.536977	480
4320	0.107573	2.259028	1498
4330	0.145031	3.045641	1410
4410	0.058622	1.231061	64
4420	0.066573	1.398033	30
4430	0.154578	3.246131	3
4440	0.140572	2.952018	149
4460	0.038222	0.802653	31

FSC	DAY COST RATIO(%)	DCSC RATIO(%)	NO. OF CONTRACTS
4510	0.259262	5.444496	704
4520	0.028654	0.601734	150
4530	0.074841	1.571654	118
4540	0.144948	3.043899	283
4610	0.128474	2.697961	31
4620	0.182220	3.826622	28
4630	0.096795	2.032693	5
4710	0.114152	2.397192	2617
4720	0.130624	2.743113	3852
4730	0.142480	2.992070	9006
4810	0.083084	1.744762	591
4820	0.149892	3.147732	4200
4910	0.171081	3.592697	270
4930	0.134445	2.823349	287
4940	0.195934	4.114613	236
5330	0.015698	0.329660	4
5340	0.134788	2.830541	6
5410	0.063564	1.334837	20
5420	0.095933	2.014589	15
5430	0.065801	1.381824	21
5440	0.230542	4.841382	69
5445	0.306267	6.431604	2
5450	0.120883	2.538532	16
5510	0.388522	8.158952	41
5660	0.285706	5.999829	19
5680	0.215581	4.527194	1
5930	1.924290	40.410080	2
6150	0.350576	7.362104	3

OVERALL RESULTS WEIGHTED BY CONTRACT FREQ

TTL DAY COST (\$)	AVERAGE CONTRACT	DAY COST RATIO (%)	DCSC RATIO (%)
9.30	6939.78	0.13402	3.21639

## EFFECT OF LATE DELIVERY ON SAFETY LEVEL COST - DESC

FSC	DAY COST RATIO(%)	DESC RATIO(%)	NO. OF CONTRACTS
1220	0.068802	2.132869	7
1240	0.015529	0.481389	55
1260	0.005823	0.180507	5
1265	0.027862	0.863718	2
1270	0.019015	0.589456	49
1280	0.022789	0.706474	46
1285	0.040959	1.269716	27
1290	0.036517	1.132018	23
1420	0.009965	0.308909	26
1430	0.013582	0.421028	56
1440	0.027119	0.840698	95
1660	0.027449	0.850931	261
4931	0.026241	0.813464	7
4935	0.032932	1.020883	34
5805	0.022388	0.694043	219
5810	0.004742	0.146987	6
5815	0.025556	0.792221	54
5820	0.028534	0.884551	62
5821	0.072451	2.245992	63
5825	0.011329	0.351208	9
5826	0.008652	0.268210	89
5830	0.023840	0.739037	30
5831	0.023855	0.739503	14
5835	0.021302	0.660358	96
5836	0.041081	1.273503	64
5840	0.032524	1.008254	57
5841	0.007752	0.240301	99
5845	0.004175	0.129433	39
5850	0.019117	0.592634	19
5855	0.031727	0.983551	97
5860	0.015731	0.487647	8
5865	0.004233	0.131210	37
5895	0.012594	0.390418	497
5905	0.026855	0.832518	2236
5910	0.058924	1.826631	1795
5915	0.041063	1.272948	600
5920	0.111831	3.466755	1497
5925	0.077689	2.408345	1155
5930	0.060524	1.876235	5040
5935	0.084658	2.624386	10918
5945	0.039238	1.216362	1785
5950	0.040009	1.240279	1555
5955	0.024527	0.760337	211
5960	0.003701	0.114716	335
5961	0.056883	1.763363	2097
5962	0.057062	1.768935	2714
5963	0.029417	0.911921	86
5965	0.041425	1.284171	457
5980	0.014845	0.460185	309
5985	0.032526	1.008297	1437
5990	0.017376	0.538653	143
5998	0.019738	0.611888	717
5999	0.049699	1.540660	1957
6005	0.065571	2.032708	1
6020	0.047466	1.471457	14
6060	0.024194	0.750028	17
6070	0.269030	8.339923	1
6625	0.055243	1.712526	1380
7010	0.022012	0.682357	24
7021	0.084745	2.627081	12
7025	0.011904	0.369023	140
7035	0.020023	0.620717	37
7045	0.036913	1.144298	168

OVERALL RESULTS WEIGHTED BY CONTRACT FREQ

TTL DAY COST (\$)	AVERAGE CONTRACT	DAY COST RATIO (%)	DESC RATIO (%)
2.56	5950.73	0.04294	1.50304

# EFFECT OF LATE DELIVERY ON SAFETY LEVEL COST- DGSC

FSC	DAY COST RATIO(%)	DGSC RATIO(%)	NO. OF CONTRACTS
1040	0.625283	21.259628	
1045	0.044920	1.527287	9
1055	0.063611	2.162788	62
1075	0.022707	0.772053	10
1080	0.108096	3.675249	1
1090	0.050377	1.712834	8
1560	0.047480	1.614306	2921
1670	0.049843	1.694660	96
1680	0.054771	1.862221	1177
2020	0.017323	0.588996	5
2030	0.053746	1.827364	32
2040	0.026097	0.887303	193
2050	0.035666	1.212659	1
2090	0.043085	1.464889	68
2530	0.155790	5.296861	1
3220	0.089313	3.036645	12
3230	0.234484	7.972448	115
3405	0.006798	0.231119	8
3413	0.044403	1.509693	5
3415	0.124876	4.245769	17
3417	0.064217	2.183383	9
3419	0.004943	0.168073	8
3426	0.165186	5.616340	17
3431	0.073000	2.482010	118
3432	0.078591	2.672085	6
3433	0.084131	2.860454	104
3436	0.098525	3.349859	4
3438	0.340821	11.587898	2
3439	0.085099	2.893369	536
3441	0.050224	1.707618	13
3442	0.017094	0.581180	1
3443	0.159162	5.411495	1
3444	0.056598	1.924344	4
3445	0.037987	1.291555	2
3446	0.125216	4.257328	2
3455	0.124047	4.217599	560
3456	0.081469	2.769945	24
3460	0.099288	3.375793	239
3465	0.114068	3.878308	31
3510	0.046790	1.590867	51
3530	0.150808	5.127467	14
3610	0.054069	1.838335	48
3611	0.030010	1.020338	7
3615	0.018495	0.628833	3
3655	0.064093	2.179173	32
3660	1.944097	66.099274	2
3680	0.205552	6.988757	1
3694	0.122058	4.149962	5
3695	0.055357	1.882145	11
3920	0.051663	1.756542	53
3940	0.023415	0.796121	66
3990	0.038025	1.292850	76
4010	1.044452	35.511353	1
4110	0.016129	0.548382	58
4120	0.014099	0.479360	22
4130	0.092625	3.149246	574
4140	0.051284	1.743658	289
4230	0.195967	6.662894	7
4240	0.202834	6.896350	998
4510	0.122330	4.159207	1
4920	0.044621	1.517118	202
4921	0.022443	0.763068	1
4925	0.130110	4.423742	3
4933	0.102437	3.482862	38



FSC	DAY COST RATIO(%)	DGSC RATIO(%)	NO. OF CONTRACTS
5220	0.133666	4.544657	33
5280	0.063616	2.162927	2
5330	0.074702	2.539870	1
5340	0.263536	8.960215	3
5355	0.094524	3.213808	732
5905	0.442336	15.039414	2
5925	0.056680	1.927125	1
5930	0.494050	16.797699	1
5940	0.076040	2.585373	1267
5970	0.088940	3.023952	1315
5975	0.117885	4.008098	166
5977	0.051477	1.750209	286
5995	0.052576	1.787577	1164
6105	0.048790	1.658852	461
6110	0.057325	1.949059	243
6115	0.029777	1.012417	78
6120	0.068514	2.329473	19
6125	0.022441	0.762990	12
6130	0.045968	1.562927	304
6135	0.271184	9.220241	378
6140	0.065651	2.232120	387
6150	0.059683	2.029219	1013
6160	0.110115	3.743905	37
6210	0.069475	2.362133	1352
6220	0.071733	2.438926	1007
6230	0.106144	3.608890	282
6240	0.229697	7.809711	3433
6250	0.098596	3.352257	330
6260	0.268726	9.136671	49
6320	0.028876	0.981797	14
6340	0.054275	1.845364	63
6350	0.086988	2.957595	198
6605	0.079508	2.703279	73
6610	0.043474	1.478104	177
6615	0.017428	0.592564	99
6620	0.103314	3.512683	314
6635	0.069294	2.356009	183
6645	0.133453	4.537395	202
6650	0.064461	2.191668	101
6655	0.170373	5.792681	8
6660	0.073698	2.505729	42
6665	0.245485	8.346492	195
6670	0.056490	1.920667	76
6675	0.079934	2.717762	91
6680	0.081340	2.765550	759
6685	0.086561	2.943058	1220
6695	0.048163	1.637531	176
6720	0.137922	4.689337	8
6730	0.107365	3.650426	25
6740	0.083571	2.841416	28
6750	0.143376	4.874769	1942
6760	0.044424	1.510421	33
6780	0.025697	0.873704	2
6810	0.071813	2.441657	270
6820	0.086850	2.952899	
6830	0.024913	0.847027	29
6840	0.134225	4.563642	50
6850	0.140097	4.763292	446
6910	0.128662	4.374509	4
6920	0.058539	1.990316	26
6930	0.097203	3.304892	6
6940	0.103831	3.530252	2
7105	0.546859	18.593185	6
7110	0.024588	0.836007	2
7125	0.155663	5.292546	5
7195	0.001075	0.036557	1
7240	0.187360	6.370245	22

FSC	DAY COST RATIO(%)	DGSC RATIO(%)	NO. OF CONTRACTS
7310	0.061286	2.083715	194
7320	0.052880	1.797911	168
7330	0.138382	4.704988	4
7340	0.250888	8.530193	2
7350	0.000000	0.000000	0
7360	0.152321	5.178929	39
7450	0.287000	9.758008	3
7530	0.219842	7.474640	1
7610	0.076097	2.587298	10
7690	0.104647	3.557991	407
8110	0.035015	1.190497	73
8120	0.052754	1.793624	43
8125	0.254758	8.661786	35
8130	0.037928	1.289550	4
8140	0.032055	1.089857	35
8145	0.034622	1.177131	13
9110	0.041477	1.410215	1
9150	0.079360	2.698224	324
9160	0.030618	1.041013	21
9320	0.063870	2.171568	279
9330	0.104138	3.540682	465
9340	0.066489	2.260625	117
9350	0.029364	0.998372	6
9390	0.076418	2.598217	273
9905	0.163992	5.575729	2
9925	0.081653	2.776201	35
9930	1.224924	41.647415	2

OVERALL RESULTS WEIGHTED BY CONTRACT FREQ

TTL DAY COST (\$)	AVERAGE CONTRACT	DAY COST RATIO (%)	DGSC RATIO (%)
7.94	9782.31	0.08116	2.75947

# EFFECT OF LATE DELIVERY ON SAFETY LEVEL COST- DISC

FSC	DAY COST RATIO(%)	DISC RATIO(%)	NO. OF CONTRACTS
2810	0.036025	1.008694	16
2835	0.016120	0.451350	166
2840	0.012791	0.358161	292
2910	0.459453	12.864675	2
2915	0.034729	0.972405	118
2925	0.017692	0.495384	53
2935	0.042041	1.177137	14
2945	0.064668	1.810702	35
2950	0.029865	0.836227	19
2995	0.028896	0.809102	102
3110	0.041118	1.151303	1583
3120	0.051428	1.439972	2398
3130	0.028944	0.810441	138
4010	0.067605	1.892930	699
4020	0.053400	1.495198	250
4030	0.101121	2.831387	404
5305	0.072831	2.039268	5188
5306	0.073211	2.049901	3935
5307	0.081037	2.269029	485
5310	0.074387	2.082839	5881
5315	0.077175	2.160912	2233
5320	0.066455	1.860746	3258
5325	0.071847	2.011713	1212
5330	0.069216	1.938056	11671
5335	0.055262	1.547347	26
5340	0.060899	1.705184	8563
5360	0.064398	1.803140	1424
5365	0.064815	1.814817	3284
6145	0.050742	1.420778	1757
8030	0.117888	3.300857	1
9505	0.070018	1.960510	59
9510	0.060597	1.696709	210
9515	0.065911	1.845497	391
9520	0.150947	4.226506	202
9525	0.063252	1.771047	44
9530	0.072433	2.028129	498
9535	0.052497	1.469924	572
9540	0.082699	2.315565	293
9545	0.197684	5.535141	1
9620	0.024011	0.672311	3
9630	0.014755	0.413142	1
9640	0.063854	1.787899	3

## OVERALL RESULTS WEIGHTED BY CONTRACT FREQ

TTL DAY COST (\$)	AVERAGE CONTRACT	DAY COST RATIO (%)	DISC RATIO (%)
2.81	4651.92	0.06043	1.81295

## EFFECT OF LATE DELIVERY ON SAFETY LEVEL COST - DPSC(Medical)

FSC	DAY COST RATIO(%)	DPSC RATIO(%)	NO. OF CONTRACTS
3020	0.027358	1.066960	2
3030	0.007544	0.294229	1
3040	0.174033	6.787286	1
3770	0.060765	2.369830	6
4320	0.310762	12.119726	1
4330	0.080177	3.126889	7
4510	0.015152	0.590917	1
4720	0.014102	0.549959	13
4730	0.074405	2.901776	4
4820	0.365295	14.246486	3
5120	0.121336	4.732091	2
5330	0.128071	4.994785	5
5340	0.042252	1.647834	1
5350	0.155289	6.056268	1
5360	0.035754	1.394411	4
5365	0.047209	1.841154	2
5930	0.144690	5.642925	3
5935	0.073846	2.879974	5
5945	0.170483	6.648836	1
5950	0.188586	7.354865	1
5977	0.128093	4.995626	2
6105	0.032420	1.264380	1
6130	0.066596	2.597233	3
6135	0.315455	12.302764	4
6140	0.152135	5.933247	3
6230	0.021832	0.851459	8
6240	0.053529	2.087626	19
6505	0.030346	1.183490	5923
6508	0.138547	5.403321	14
6510	0.031538	1.229989	293
6515	0.018286	0.713146	1210
6520	0.060101	2.343944	911
6525	0.012939	0.504636	21
6530	0.017685	0.689724	470
6532	0.005628	0.219507	95
6540	0.038559	1.503784	668
6545	0.008996	0.350830	34
6550	0.019035	0.742355	151
6630	0.041958	1.636343	79
6640	0.023966	0.934662	174
6645	0.018432	0.718830	3
6650	0.041320	1.611489	7
6665	0.013457	0.524832	11
6670	0.034272	1.336624	4
6680	0.017616	0.687019	6
6685	0.162899	6.353080	16
6695	0.040940	1.596661	2
6810	0.037282	1.453996	7
6840	0.036245	1.413572	2
6850	0.015360	0.599028	9
6910	0.014869	0.579905	7
7125	0.003381	0.131852	8
7210	0.004518	0.176200	34
7240	0.025412	0.991053	3
7290	0.016638	0.648893	2
7350	0.023847	0.930041	2
7510	0.025798	1.006123	2
7520	0.045050	1.756953	5
7530	0.043017	1.677647	10
7690	0.219926	8.577126	14
7930	0.042194	1.645552	3
8105	0.117866	4.596786	5
8115	0.066633	2.598677	11
8120	0.314997	12.284864	4

FSC	DAY COST RATIO(%)	DPSC RATIO(%)	NO. OF CONTRACTS
8335	0.094738	3.694784	4
8455	0.036258	1.414063	1
8465	0.002905	0.113284	5
8530	0.130199	5.077768	9

OVERALL RESULTS WEIGHTED BY CONTRACT FREQ

TTL DAY COST (\$)	AVERAGE CONTRACT	DAY COST RATIO (%)	DPSC RATIO (%)
10.64	36804.55	0.02891	1.41638

